Lostine Corridor Public Safety Project
BOTANICAL

Introduction

Suitable habitat to support numerous Region – 6 Sensitive botanical species including 11 types of moonwarts (Botrychium spp.) exists in the proposed project area. This project will have no effect on any threatened or endangered botanical species and will not result in moving any sensitive species towards federal listing. The Lostine Corridor Safety Project will not likely adversely degrade populations of this species to the degree that there is a loss of species viability or population qualities for which the species was identified as an outstandingly remarkable value (ORVs) in the Lostine River Wild and Scenic River Management Plan.

Proposed Action

The primary purpose and need of this project is to address the public safety issues in the corridor. Secondly, the project will address risks to the other values in the corridor including infrastructure (homes, cabins, recreation improvements, roads), the natural resource values. To reduce risks to these values the Forest Service is proposing the following within the project area boundary (approx. 2,110 acres):

- Removing hazard trees along travel routes and adjacent to residential, recreation, historic and improvements (addressing immediate hazards to people and infrastructure).
- Thinning stand densities to decrease severity of wildfire and to improve forest resiliency (addressing both risks to ingress and egress in the corridor in the event of wildfire, and risk of insect and disease impacts over the long term).
- Removing fuels (surface fuels, ladder fuels, and small woody debris) throughout the corridor, particularly in the wildland urban interface.
- Creating small (less than 2 acre) gaps/openings in lodge pole stands to break up continuous fuels so fire could be managed more effectively.

The project will also assess opportunities to provide wood products for local markets, including firewood, through implementation.

Analysis Framework and Direction

Wallowa-Whitman National Forest Plan (1990)

Management direction is derived from the Wallowa-Whitman National Forest Land and Resource Management Plan (Forest Plan). The Forest Plan the goal for diversity of botanical resources are, to "*Maintain native and desirable introduced or historic plant and animal species and communities. Provide for all seral stages of terrestrial and aquatic plant associations in distribution and abundance to accomplish this goal. Maintain or enhance ecosystem function to provide for long-term integrity and productivity of biological communities*." (Forest Plan, pp 4-1, 4-2)

Lostine River Wild and Scenic River Management Plan (1993)

The Lostine River Wild and Scenic River Management Plan (River Plan) established the following desired future condition for botanical values for 11 miles of the Lostine River and corridor designed as a 'recreational' river:

- Emphasize the maintenance and enhancement of the numerous plant species and communities which are found in the river corridor.
- All species which currently exist will continue to thrive and the occurrence of non-native plants which compete with and displace native species will be reduced or eliminated.
- Special attention will be placed on those plant species or communities considered to be endangered, threatened, sensitive or otherwise unique. (River Plan, pp. 11-12)

The River Plan also provides some guidelines for management that are relevant to this project including:

- Utilize a full range of silvicultural techniques for improving forest health with an emphasis towards uneven-age management. Utilize thinning from below, underburns, and other methods to improve forest health that do not rely on the use of heavy equipment on site. Emphasis shall be on long-term forest health rather than short-term
- Restrict use and access in critical *PETS*[1] species habitat areas. Require permits for those interested in studying *PETS* species in critical habitat areas. This permit is to allow the Forest Service to monitor this type of use.
- Monitor existing campgrounds and dispersed campsites to determine impacts to *PETS* plants. Mitigate adverse impacts found during monitoring.
- Rehabilitate sites with native species.
- Recognize, promote, and enhance the qualities which will preserve the ecological corridor.
- Encourage fire as a tool to manage vegetation, improve forest health, and reduce fire hazards.

Existing Condition

Federally Listed Threatened or Endangered Species

No federally listed threatened or endangered species, designated critical habitat, species proposed for listing or proposed critical habitat is known to be within or occupy the project area.

Region 6 Sensitive Species

Table 1 displays a list of Region 6 Forest Service Sensitive species and the predicted effects of the proposed action.

[1] At the time the River Plan was written, PETS was a term used to represent Proposed Endangered Threatened and Sensitive species. At this time, there are no Threatened or Endangered botanical species within the project area.

Species of Interest

The Lostine River Plan discusses a group of plant species that were considered as an ORV for which the river was designed a Wild and Scenic River. The River Plan's environmental analysis describes types of botanical species that were considered. Table 1 contains a list of botanical species described in the River Plan and the predicted effects of the proposed action.

Effects Analysis Methodology

Spatial Boundary

The direct, indirect and cumulative effects analysis area is equivalent to the project area boundary. The actions proposed within the project area boundary would not affect Region 6 sensitive species beyond the project area boundary. The plants discussed here are essentially stationary (except for their reproductive structures) and do not move in and out of the project boundary.

Temporal Boundary

Time frames for the direct, indirect and cumulative effects analysis are: short-term (0 to 3 years), mid-term (3 to 10 years), and long-term (10 to 30 years). These temporal assumptions are based on interpretations of the species listed in table 1 life cycles, life histories, ecological setting, and presumed adaptation to natural disturbance cycles.

Environmental Consequences

Effects

Adoption and implementation of the proposed mitigation measures, discussed below, as project design elements are expected to reduce the potential for the proposed actions to have direct and indirect effects and therefore minimize any potential cumulative effects from this project interacting with past or future projects. These mitigation measures have been utilized in the past and have been shown to be effective in reducing potential impacts from soil disturbance and changes in stand conditions.

The intent and function of these mitigation measures would be to minimize ground disturbance at patches of identified botanical resources and moderate changes in stand conditions in and adjacent to sensitive plant sites and other botanically unique areas, such that no more than some individuals would be affected and the populations as a whole would be resilient to future natural or human-caused disturbances. They aim to further the capacity these species possess to sustain themselves at their current sites as well as and colonize new areas within the corridor as conditions permit.

Proposed Mitigations:

BT-1-- Within treatment areas that Region 6 sensitive plants and/or Wild and Scenic River Outstandingly Remarkable Value Species are known to occur (via past surveys or pre-implementation stand monitoring) apply applicable avoidance mitigation measures for specific species.

BT-2-- If hazardous tree conditions are identified within Region 6 sensitive plant and/or Wild and Scenic River Outstandingly Remarkable Value Species plant site(s), directionally fall trees away from the site to the degree that can be safely accomplished. When a tree cannot be felled away from the site, then fall and leave it on-site. Unless leaving on site conflicts with visuals, recreation, or hazardous fuel loading.

Federally Listed Threatened or Endangered Species

There will be no effects to any federally listed threatened or endangered species, designated critical habitat, species proposed for listing or proposed critical habitat, since none exist within the project area.

Region 6 Sensitive Species

There may be direct effects to individual or habitats for some R-6 sensitive plant species and species of interest. Individuals may be crushed or trampled and some habitat will be altered. However, none of the proposed actions will move any R-6 sensitive species toward federal listing. Table 1 lists the determination for R-6 sensitive plants species, may impact individuals, or habitat, but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or the species.

Species of Interest

There may be direct effects to individual or habitats for some species of interest. Individuals may be crushed or trampled and some habitat will be altered. However, the proposed actions are not likely to adversely degrade populations of these species to the degree that there is a loss of species viability or population qualities for which the species was identified as an ORV in the River Plan.

The proposed activities (hazard tree removal, resiliency thinning, fuels thinning, group selection cuts, and hand and machine piling) have the potential to affect soil conditions and the microclimates needed for Region 6 sensitive plant species or ORV species.

Most of these plant species are highly mycorrhizal fungal dependent, relying on their connections to that network for some of their sustenance. Disrupting that network, through soil disturbance or green tree removal, may also have negative effects to these species' ability to obtain and store resources though this fungal network.

The Botrychium species are believed to be plants that do follow some kinds of disturbance around the landscape, primarily geological and fire related disturbances. It is presumed that disturbance cycles appropriate for many botrychium species would 30 or more years, depending on the type (Ahlenslager and Potash 2007). Proposed mitigations are intended to sustain current and future populations. Mitigation measures that decrease the chance of invasive species spread would need to be in place.

Cumulative Effects

The toilet replacements, French Camp restoration, and recreation site reconstruction actions were developed with design and mitigation features that eliminated or minimized potential effects to R-6 sensitive plant species. The mitigations were developed with the goal that only a few individuals were expected to be impacted and not to the degree that harmed the viability of their populations overall. There are no cumulative effects expected from these activities when adding the current proposed actions. Previous hazard tree and fuel manipulation project effects in general have been conducted with mitigations and design features similar to what is proposed for this project. The potential for cumulative effects would be low. The actions known to have had effects in the past are some of the hazard tree reduction activities that are required around developed recreation sites that overlap with sensitive plant sites.

Reasonably foreseeable future projects within the Lostine Pubic Safety Project Area include maintenance of recreation sites. Most recreation sites in the Lostine River Corridor are located within the Lostine River Riparian Habitat Conservation Areas. Removal of hazard trees in and around recreation sites will continue to occur into the future. Impacts from recreation activities are not expected to expand drastically over the long term.

The proposed action in combination with past projects will have no anticipated adverse cumulative effects. This proposed project would not change the distribution or abundance of botanical species.

Consistencies

Based on the information documented in this report, the proposed actions under the Lostine Project are found to be consistent with Forest Plan as amended by the Lostine Wild and Scenic River Plan.

Table 1. Region 6 Sensitive listed plants and ORV species with effect determinations.

Species	Background / Setting	R6 Sensitive Species/ORV	Effects Determination of Proposed Action
Upswept moonwort; Upward Lobed Moonwort (*Botrychium ascendens*)	Documented on the WWNF. Suitable habitat found within the analysis area. Known sites will be protected from ground disturbance through project implementation design conditions.	R6 Sensitive Species/ORV	MIIH[1] MIIH[2]
Lowa Moonwort (*Botrychium campestre*)	Documented on the WWNF. Suitable habitat found within the analysis area. Known sites will be protected from ground disturbance through project implementation design conditions.	R6 Sensitive Species/ORV	MIIH[1] MIIH[2]

Scalloped Moonwort (*Botrychium crenulatum*)	Documented on the WWNF. Suitable habitat found within the analysis area. Known sites will be protected from ground disturbance through project implementation design conditions.	R6 Sensitive Species/ORV	MIIH[1] MIIH[2]
Slender Moonwort (*Botrychium lineare*)	Documented on the WWNF. Suitable habitat found within the analysis area. Known sites will be protected from ground disturbance through project implementation design conditions.	R6 Sensitive Species/ORV	MIIH[1] MIIH[2]
Common Moonwort (*Botrychium lunaria*)	Documented on the WWNF. Suitable habitat found within the analysis area. Known sites will be protected from ground disturbance through project implementation design conditions.	R6 Sensitive Species/ORV	MIIH[1] MIIH[2]
Western Goblin, Mountain Moonwort (*Botrychium montanum*)	Documented on the WWNF. Suitable habitat found within the analysis area. Known sites will be protected from ground disturbance through project implementation design conditions.	R6 Sensitive Species/ORV	MIIH[1] MIIH[2]
Paradox Moonwort (*Botrychium paradoxum*)	Documented on the WWNF. Suitable habitat found within the analysis area. Known sites will be protected from ground disturbance through project implementation design conditions.	R6 Sensitive Species/ORV	MIIH[1] MIIH[2]
Stalked Moonwort (*Botrychium pedunculosum*)	Documented on the WWNF. Suitable habitat found within the analysis area. Known sites will be protected from ground disturbance through project implementation design conditions.	R6 Sensitive Species/ORV	MIIH[1] MIIH[2]
Deflexed Bottle-brush Sedge (*Carex retrorsa*)	Documented on the WWNF. Suitable habitat found within the analysis area. Species not detected during inventories of proposed treatment areas.	R6 Sensitive Species/ORV	No Impact
Rockbrakes, Parsley Ferns (*Cryptogramma stelleri*)	Documented on the WWNF. Suitable habitat found within the analysis area. Not detected during inventories of proposed treatment areas.	R6 Sensitive Species/ORV	No Impact
Clustered Lady's Slipper (*Cypripedium fasciculatum*)	Documented on the WWNF. Suitable habitat found within the analysis area. Species not detected during inventories of proposed treatment areas.	R6 Sensitive Species/ORV	No Impact

Northern Twayblade (*Listera borealis*)	Documented on the WWNF. Suitable habitat found within the analysis area	R6 Sensitive Species/ORV	MIIH[1] MIIH[2]
Ground Cedar (*Lycopodium complanatum*)	Documented on the WWNF. Suitable habitat found within the analysis area. Species not detected during inventories of proposed treatment areas.	R6 Sensitive Species/ORV	No Impact
Toothed Wintergreen (*Pyrola dentata*)	Documented on the WWNF in the Lostine Watershed, but suitable habitat was not found within proposed treatment areas.	R6 Sensitive Species/ORV	No Impact
Jelly Lichen *(Collema curtisporum)*	Suitable habitat found within the analysis area. Species not detected during inventories of proposed treatment areas.	ORV	No Impact
Alpine Buckler fern *(Dryopertis expansa*	Suitable habitat found within the analysis area. Species not detected during inventories of proposed treatment areas.	ORV	No Impact
Interrupted Club-moss *(Lycopodium annotinum)*	Known sites will be protected from ground disturbance through project implementation design conditions.	ORV	MIIH[2]
Triangle Moonwort *(Botrychium lanceolatum)*	Known sites will be protected from ground disturbance through project implementation design conditions.	ORV	MIIH[2]
Mingan moonwort *(Botrychium minganense)*	Known sites will be protected from ground disturbance through project implementation design conditions.	ORV	MIIH[2]
Leathery Grapefern *(Botrychium multifidum)*	Known sites will be protected from ground disturbance through project implementation design conditions.	ORV	MIIH[2]
Northwestern Moonwort *(Botrychium pinnatum)*	Known sites will be protected from ground disturbance through project implementation design conditions.	ORV	MIIH[2]
Least Moonwort *(Botrychium simplex)*	Known sites will be protected from ground disturbance through project implementation design conditions.	ORV	MIIH[2]
Rattlesnake Fern *(Botrychium virginianum)*	Suitable habitat found within the analysis area. Species not detected during inventories of proposed treatment areas.	ORV	No Impact
Spinulose Shield Fern (*Dryopteris austriaca)*	Suitable habitat found within the analysis area. Species not detected during inventories of proposed treatment areas.	ORV	No Impact

Male Fern *(Dryopteris filix-mas)*	Known sites will be protected from ground disturbance through project implementation design conditions.	ORV	MIIH[2]
Northern Hollyfern *(Polysticum lonchitis)*	Suitable habitat found within the analysis area. Species not detected during inventories of proposed treatment areas.	ORV	No Impact
Narrowleaf Swordfern *(Polystichum imbricans)*	Suitable habitat found within the analysis area. Species not detected during inventories of proposed treatment areas.	ORV	No Impact
Western Swordfern *(Polysticum munitum)*	Known sites will be protected from ground disturbance through project implementation design conditions.	ORV	MIIH[2]
Anderson's Hollyfern *(Polysticum andersonii)*	Suitable habitat found within the analysis area. Species not detected during inventories of proposed treatment areas.	ORV	No Impact
Oak Fern *(Gymnocarpium disjunctum)*	Suitable habitat found within the analysis area. Species not detected during inventories of proposed treatment areas.	ORV	No Impact
Green Spleenwort *(Asplenium trichomanes-ramosum)*	Suitable habitat found within the analysis area. Species not detected during inventories of proposed treatment areas.	ORV	No Impact
Variegated Scouringrush *(Equisetum variegatum ssp. Variegatum)*	Suitable habitat found within the analysis area. Species not detected during inventories of proposed treatment areas.	ORV	No Impact

MIIH[1] = May Impact Individuals or habitat, but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.

MIIH[2] = May Impact Individuals or habitat, but will not likely adversely degrade populations of this species to the degree that there is a loss of species viability or population qualities for which the species was identified as an outstandingly remarkable value in the Lostine River Wild and Scenic River Management Plan.